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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHAEL P. HOLLIER and ALEXANDRE BOURRET

Appeal 2009-002240
Application 09/889,041
Technology Center 2600

Decided: September 17, 2009

Before ROBERT E. NAPPI, MARC S. HOFF, and THOMAS S. HAHN, *Administrative Patent Judges.*

NAPPI, *Administrative Patent Judge.*

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 6(b) of the rejection of claims 1 through 20.

We affirm.

INVENTION

The invention is directed to a method for the analysis of video signals. See page 1 of Appellants' Specification. Claim 1 is reproduced below:

> 1. A method of measuring the differences between a first video signal and a second video signal, said method comprising:
> analyzing information content of each video signal to identify perceptually relevant boundaries of video images depicted therein;
> comparing boundaries so defined in the first signal with those in the second signal, the comparison including determination of the extent to which the properties of boundaries defined in the first image are preserved in the second image; and
> generating an output indicative of perceptual difference between the first and second signals.

REFERENCES

Zhou US 5,550,580 Aug. 27, 1996

Greg Cermak, Pat Tweedy, Stephen Wolf, Arthur Webster, and Margaret Pinson, "Objective and Subjective Measures of MPEG Video Qualities," ANSI T1A1 contribution number T1A1.5/96-121, October 28 1996.[1]

S.J.P. Westen, R.L. Lagendijk, and J. Biemond, "Perceptual Image Quality Based on a Multiple Channel HVS Model," Acoustics, Speech and Signal Processing, 1995, ICASSP-95, 1995 International Conference, May 9-12, 1995, ISBM 0-7803, 2431-5.

V, Bhasharan, K. Konstantinides, and G. Beretta, "Text and Image Sharpening of Scanned Images in the JPEG Domain," Image processing

[1] Hereinafter referred to as T1.

1997. Proceedings, International Conference on, October 26-29, 1997, INSPED Accession No. 5899875.

REJECTIONS AT ISSUE

The Examiner has rejected claims 1 through 7 and 12 through 18 under 35 U.S.C. § 102(b) as being anticipated by T1. The Examiner's rejection is on pages 4 through 6 of the Answer.[2]

The Examiner has rejected claims 8, 19, and 20 under 35 U.S.C. § 103(a) as being unpatentable over T1 in view of Westen. The Examiner's rejection is on pages 6 through 8 of the Answer.

The Examiner has rejected claims 9 and 10 under 35 U.S.C. § 103(a) as being unpatentable over T1 in view of Westen and Zhou. The Examiner's rejection is on pages 8 and 9 of the Answer.

The Examiner has rejected claim 11 under 35 U.S.C. § 103(a) as being unpatentable over T1 in view of Westen and Bhasharan. The Examiner's rejection is on pages 9 and 10 of the Answer.

ISSUES

Rejection of claims 1 through 7 and 12 through 18

Appellants argue on pages 13 through 17 of the Brief[3] that the Examiner's rejection of claims 1 through 7 and 12 through 18 under 35 U.S.C. § 102(b) is in error. Appellants argue that T1 does not teach "analyzing information

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[2] Throughout the opinion we refer to the Answer mailed January 15, 2008.
[3] Throughout the opinion we refer to the Brief dated August 28 2007 we note that the Supplemental Brief, dated October 9, 2007 contains the same arguments presented in the August 28 2007 Brief with the addition of headings.

content of each video signal to identify perceptually relevant boundaries of video images depicted therein" as recited in independent claim 1. Brief 13. Appellants assert that the Examiner erred in equating the analysis to identify edges taught by T1 with this limitation of claim 1 as "in many images, edges are not perceptually relevant." *Id.* On page 17 of the Brief Appellants, argue that the rejection of claims 5 and 16 is also in error as claim 5 recites analyzing changes in one of the properties of luminance, color or texture. Appellants argue that T1 does not teach or suggest this limitation.

Thus, Appellants' contentions directed to the rejection of claims 1 through 7 and 12 through 18 present us with the issue: Have Appellants shown that the Examiner erred in finding that T1 teaches analyzing information content of each video signal to identify perceptually relevant boundaries of video images depicted therein as recited in independent claim 1?[4] Additionally with respect to claims 5 and 16[5] Appellants' contentions present us with the issue of: have Appellants shown that the Examiner erred in finding that T1 teaches analyzing changes in one of the properties of luminance, color or texture?

Rejections of claims 8 through 11, 19, and 20.

Appellants' arguments, on pages 17 and 18 of the Brief, directed to the Examiner's rejections of claims 8 through 11, 19, and 20 assert that the rejections under 35 U.S.C. § 103(a) are in error as the additional references cited by the Examiner do not cure the deficiencies noted in the rejection

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[4] Appellants' arguments group claims 1 through 4, 6, 7, 12 through 15, and 17 together, we select claim 1 as a representative claim.

based upon T1. Thus, Appellants' contentions directed to these rejections present us with the same issue as claim 1 from T1; if T1 is deficient, then the issue turns on whether Weston, Zhou, and/or Bhasharan cure such deficiency in T1?

PRINCIPLES OF LAW

Anticipation is established only when a single prior art reference discloses, expressly or under the principles of inherency, each and every element of a claimed invention as well as disclosing structure which is capable of performing the recited functional limitations. *RCA Corp. v. Applied Digital Data Systems, Inc.*, 730 F.2d 1440, 1444 (Fed. Cir. 1984); *W.L. Gore and Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1554 (Fed. Cir. 1983).

FINDINGS OF FACT

1. Appellants' Specification states:

> The boundaries between the main elements of an image may be identified by any measureable property used by the human perceptual system to distinguish between such elements. These may include, but are not limited to color, luminance, so called "hard" edges (a narrow line of contrasting colour or luminance defining an outline or other boundary) . . . . An error will be more perceptible if it disrupts the shape of one of the essential features of the image. For example, a distortion present on an edge in the middle of a textured region will be less perceptible than the same error on an independent edge.

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[5] Appellants' arguments group claims 5 and 16 together, we select claim 5 as representative.

Specification 4:27-26.

2. Appellants' Specification in discussing the Figure 3 perceptual stage states that the images are filtered and masked to "identify characteristics of the edges or boundaries of the principal components of each image." Specification 9:31-32.
3. T1 teaches several methods of measuring the quality of compressed video signal. P. 1
4. One method involves comparing spatial statics of information in video scene. This involves a process to extract spatial information from the images by edge enhancement. T1, p. 10, para. 3.2.1, and 3.2.1.1. and Figure 4.
5. In experiments the spatial data is taken and filtered to create a Negsob and a Possob image for each of the input (uncompressed) images and output (compressed) images. The two Negsob (or Possob) images are compared to create an error signal. T1. p. 13, para. 3.2.1.4, Figure 7.
6. The images in Figures 4 and 7 are generated based upon the gradient (luminance) of the pixel values. T1, p. 10, para. 3.2.1, and 3.2.1.1
7. T1 teaches that the images were also provided to users and that the Negsob provided the best single predictor of subjective video quality. T1, p. 40, para. 5.3.1.

ANALYSIS

Rejection of claims 1 through 5, 6, 7, 12 through 15, and 17

Appellants have not persuaded us that the Examiner erred in finding that T1 teaches analyzing information content of each video signal to

identify perceptually relevant boundaries of video images depicted therein as recited in independent claim 1. The Examiner has found that T1 teaches analyzing the information of each image to identify edges, and that the edges meet the claimed "perceptually relevant boundaries." Answer 4. The Examiner states that he is not persuaded by Appellants' arguments as "the quotations [from Appellants' Specification] only illustrate examples of a perceptually relevant boundaries, it does not provide a clear definition of perceptually relevant boundaries." Answer 12-13. We concur with the Examiner's findings.

Initially, we note that Appellants have not contested the Examiner's finding that T1 teaches the analysis to determine edges. Rather, Appellants' arguments assert that the analysis to identify edges is not the same as the claimed perceptually relevant boundary. Claim 1 recites analyzing to "identify perceptually relevant boundaries." Appellants argue that the term "perceptually relevant boundary" is defined in Appellants' Specification on page 4 lines 7-21. We have reviewed this portion of Appellants' Specification and note that it specifically states that the elements considered perceptual "include but [are] not limited to . . . edges." See Fact 3. Thus, as the Examiner states, Appellants' asserted definition is nothing more than a list of examples of items that may constitute perceptual boundaries. The list includes edges, the feature which the Examiner has found (and Appellants have not contested) is taught by T1. This finding by the Examiner is supported by ample evidence. Fact 4. Accordingly, we are not persuaded that the Examiner erred in finding that T1 teaches analyzing information content of each video signal to identify perceptually relevant boundaries of video images depicted therein as recited in independent claim 1.

Further, we are not persuaded by Appellants' argument that T1 teaches sensing all edges and as such is different from the claimed invention, as some edges are not perceptually relevant. Brief 13. Appellants have not shown that any of the edges identified in the edge enhancement of T1 are not perceptually relevant. Further, the discussion in T1 of the results of comparing the image analysis with measures based upon people's perceptions is that the Negsob (which is a comparison of spatial information produced by the edge enhancement algorithms) is the single best predictor of video quality. Facts 5 and 7.

Additionally, we are not persuaded by Appellants' argument that the "claimed inventions patentably define over the teachings of the T1 reference by 'analyzing the information content of each video signal to identify the perceptually relevant boundaries of the video images' and disregarding perceptually unimportant differences by only 'comparing boundaries so defined' as relevant." Brief 16. This argument is not with claim 1 as claim 1 does not recite a step of disregarding perceptually unimportant information.

For the aforementioned reasons, Appellants' arguments directed to the rejection of claim 1 have not persuaded us of error in the Examiner's rejection of claim 1. Accordingly we sustain the Examiner's rejection of claims 1 through 4, 6, 7, 12 through 15, and 17.

Rejection of claims 5 and 16

Appellants' arguments have not persuaded that the Examiner erred in finding that T1 teaches analyzing changes in one of the properties of luminance, color or texture. Claim 5 recites "wherein the characteristics

include changes in at least one of the properties of: luminance, color or texture." The Examiner has found that T1 teaches that the characteristic analyzed in T1 is the gradient or luminance. Answer 5, 13. We concur with the Examiner's finding as we find that it is supported by ample evidence (Fact 6) and Appellants have not cited any evidence to rebut the Examiner's finding. Accordingly, we sustain the Examiner's rejection of claims 5 and 16.

Rejections of claims 8 through 11, 19, and 20.

As discussed above, Appellants' arguments directed to the Examiner's rejections of these claims presents the same issue as discussed above with respect to claim 1. Accordingly, for the reasons discussed with respect to claim 1, we sustain the Examiner's rejection of:

a) claims 8, 19, and 20 under 35 U.S.C. § 103(a) as being unpatentable over T1 in view of Westen;

b) claims 9 and 10 under 35 U.S.C. § 103(a) as being unpatentable over T1 in view of Westen and Zhou; and

c) claim 11 under 35 U.S.C. § 103(a) as being unpatentable over T1 in view of Westen and Bhasharan.

CONCLUSION

Appellants haves not persuaded us of error in the Examiner's rejection of claims 1 through 20.

ORDER

The decision of the Examiner to reject claims 1 through 20 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

ELD

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